



# New Jersey Inspection and Maintenance (I/M) Program

Stakeholder Meeting  
November 30, 2005



# Overview

- Why Do We Inspect Vehicles
- Importance of the On-Road Vehicles
- When Do Emission Reductions Occur
- Future Fleet
- Future Inspection Technologies



# Ozone - Health Effects

- Decreases lung function
- Coughing and pain in the chest
- Increases susceptibility to respiratory infections
- Permanent damage to lungs
- Promotes allergic reactions
- Premature Death

Health consequences associated with exposure to elevated levels of Ozone in New Jersey in 2002

• Respiratory symptoms -	742,000
• Asthma attacks -	44,000
• Hospital admissions -	920
• Asthma(new illnesses) -	480
• Premature Deaths -	80
• Emergency room visits -	30



# Fine Particle Health Effects

- Premature death
- Respiratory related hospital admissions and emergency room visits
- Aggravated asthma
- Coughing and difficulty or pain breathing
- Chronic bronchitis
- Decreased lung function
- Diesel carcinogen
- Work and school absences

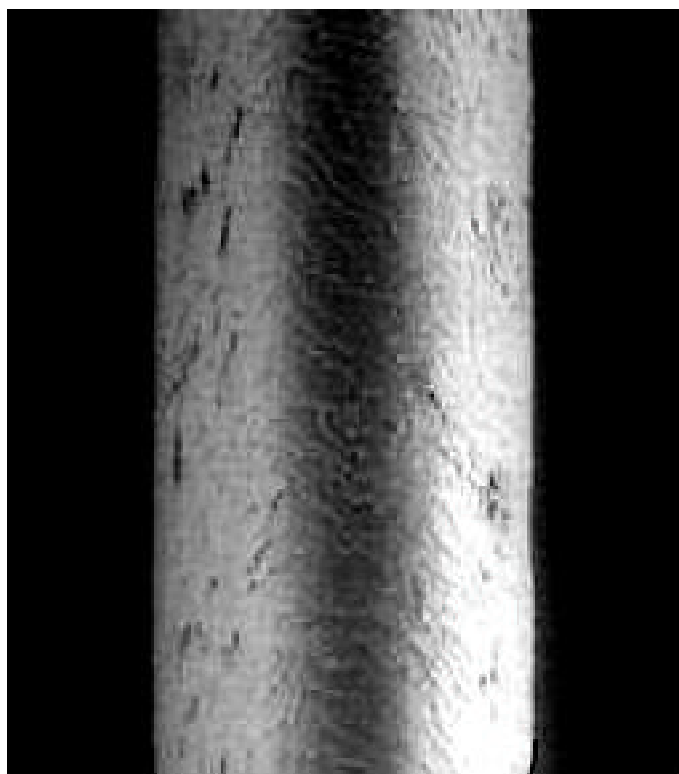
Every year in New Jersey, exposure to fine particulate pollution above the current annual standard results in...

- More than 1,000 premature deaths
- Up to 68,000 asthma attacks



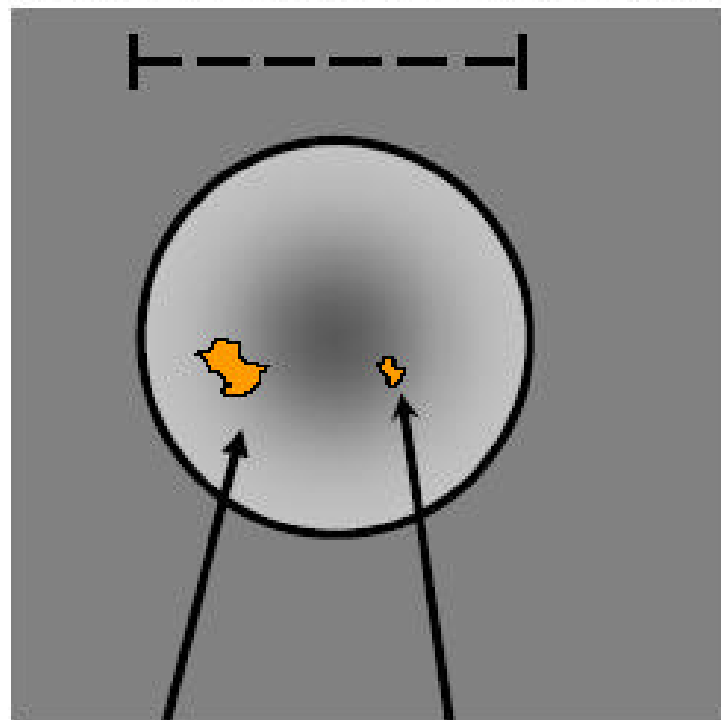
## Fine Particulate Matter: What is it?

A complex mixture of extremely small particles and liquid droplets that measure  $\leq 2.5$  microns ( $\mu\text{m}$ ) in diameter



Human Hair ( $70 \mu\text{m}$  diameter)

Hair cross section ( $70 \mu\text{m}$ )



PM<sub>10</sub>  
(10 $\mu\text{m}$ )

PM<sub>2.5</sub>  
(2.5  $\mu\text{m}$ )



# Mobile Source Air Toxics: Health Effects

- **Nasal & Lung Cancer**

Acetaldehyde, Diesel PM, Formaldehyde, Naphthalene, POM, Arsenic, Chromium, & Nickel Compounds.

- **Leukemia**

Benzene & 1,3 Butadiene

- **Damage to Respiratory System (especially nose)**

Acrolein, Naphthalene, & Chromium Compounds

- **Damage to Circulatory System**

Arsenic Compounds

- **Learning Disabilities**

Lead & Mercury Compounds

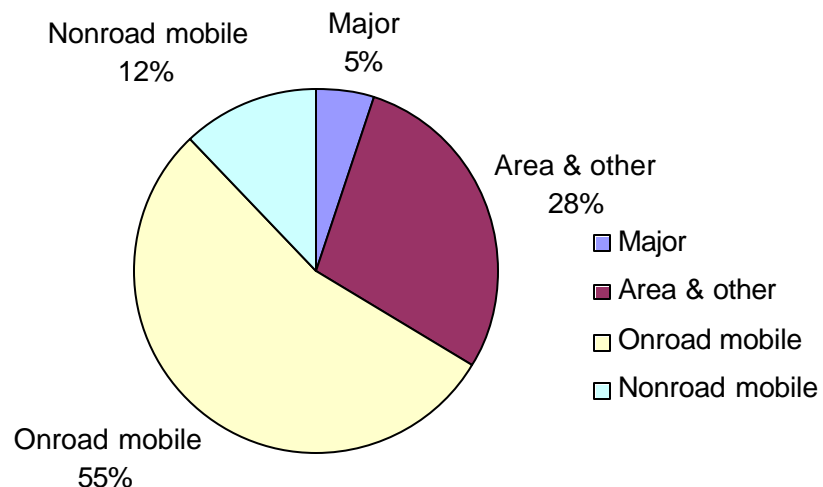
- **Damage to Nervous System**

n-Hexane, Manganese Compounds, Xylene, Toluene, & Styrene

- **Liver & Kidney Damage**

MTBE & Manganese Compounds

**Contribution by Source Sector to the Average Cancer Risk in NJ**  
**Average Cancer Risk = 21 in one million**

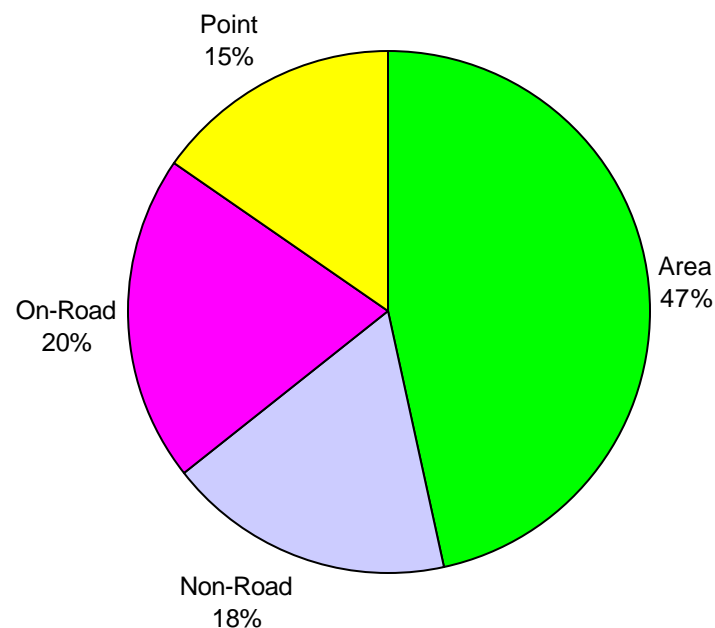


Data Source: USEPA



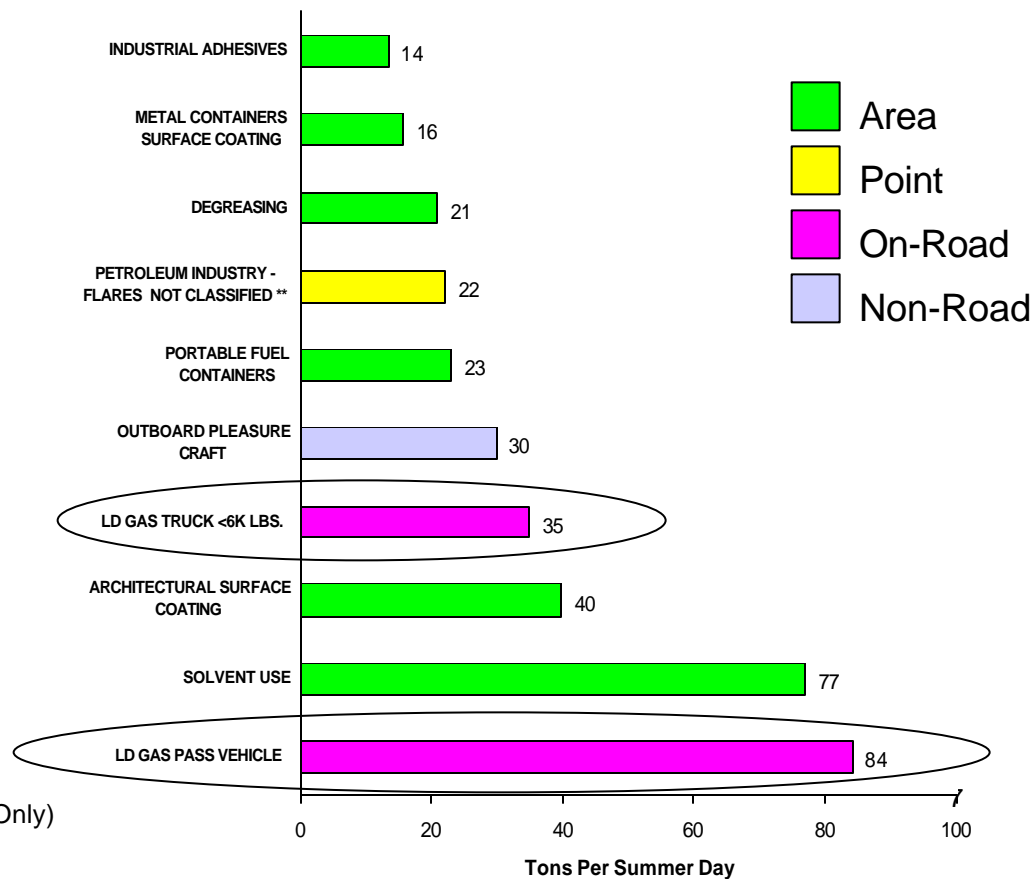
# Volatile Organic Carbon (VOC) Emissions

Draft Projected 2010 New Jersey VOC Emissions



Total VOC Emissions = 737 tpd (Anthropogenic Sources Only)

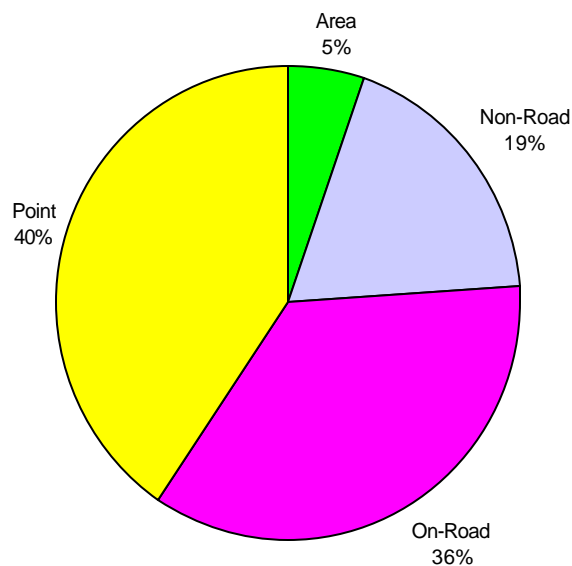
DRAFT 2010 New Jersey VOC Emission Inventory Top 10





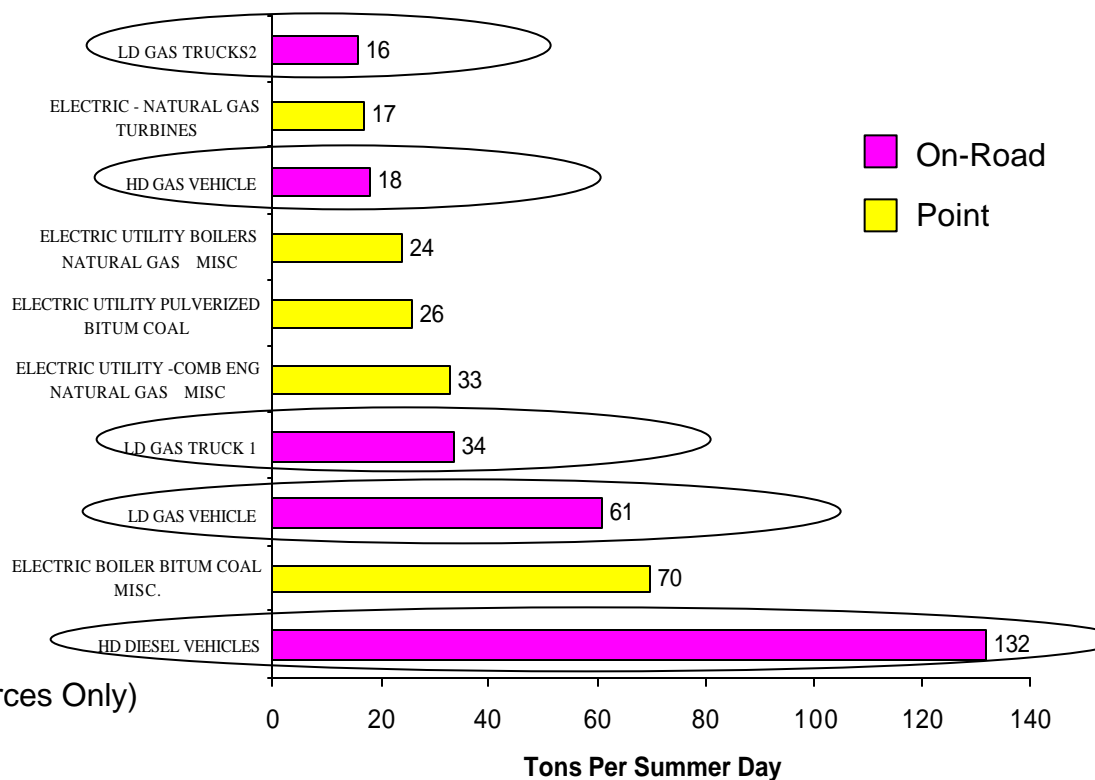
# Oxides of Nitrogen (NOx) Emissions

Draft 2010 NOx Emissions



Total NOx Emissions = 736 tpd (Anthropogenic Sources Only)

DRAFT 2010 New Jersey NOx Emission Inventory Top 10



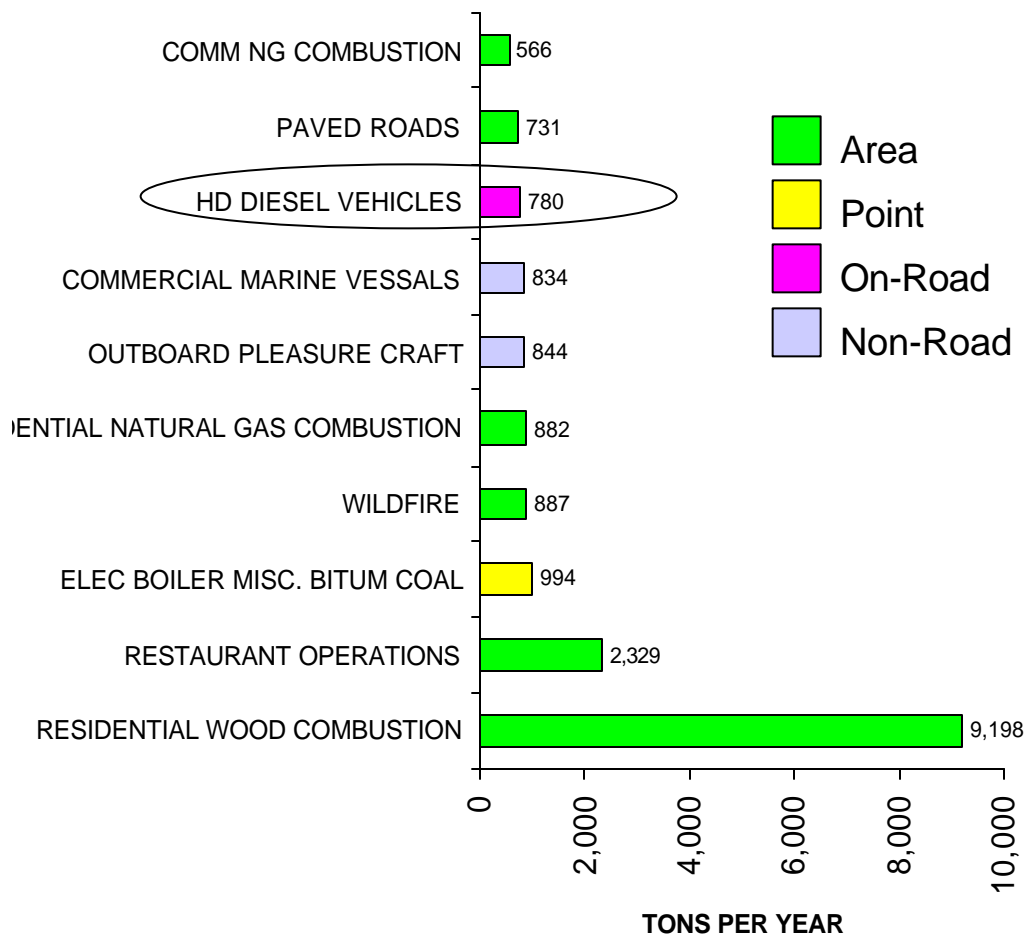
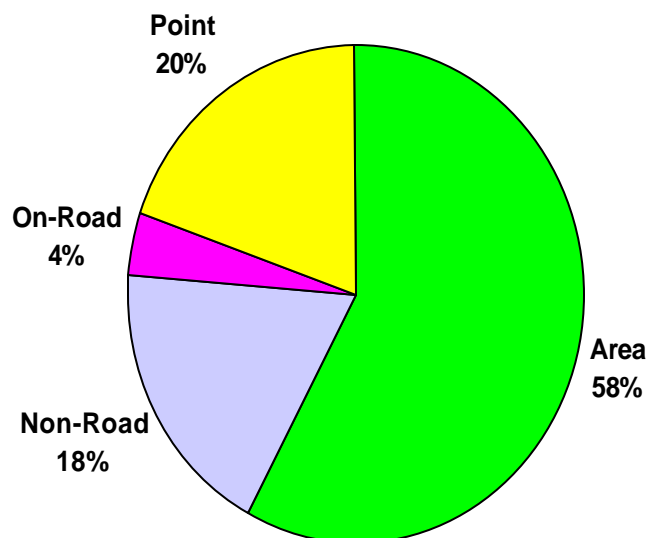




# Direct Fine Particle (PM<sub>2.5</sub>) Emissions

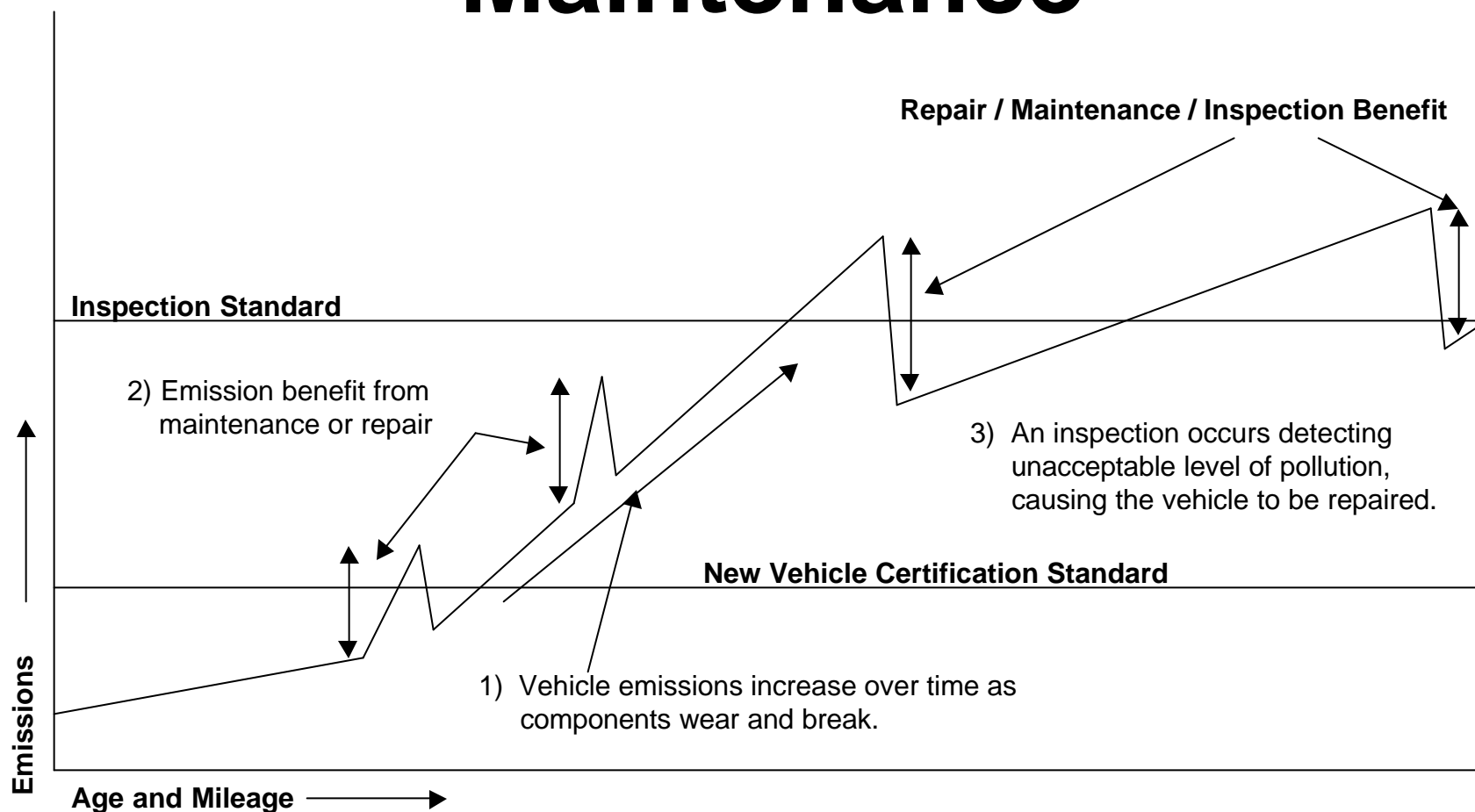
DRAFT 2010 New Jersey PM 2.5 (with Fugitive Dust) Emission Inventory  
Top 10

Draft Projected 2010 New Jersey PM 2.5  
Emissions by Sector



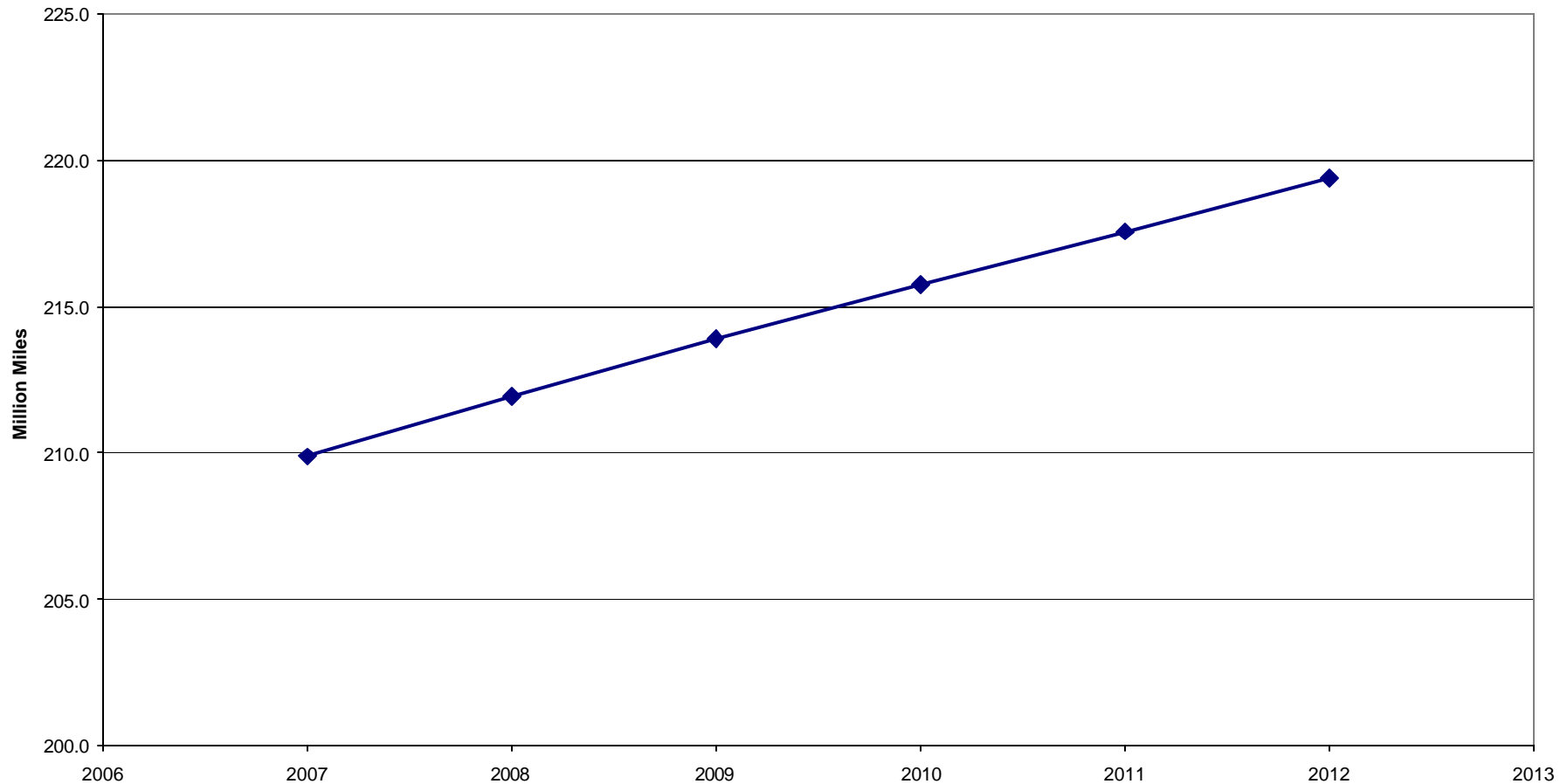


# Conceptual Benefits of Vehicle Inspection and Maintenance



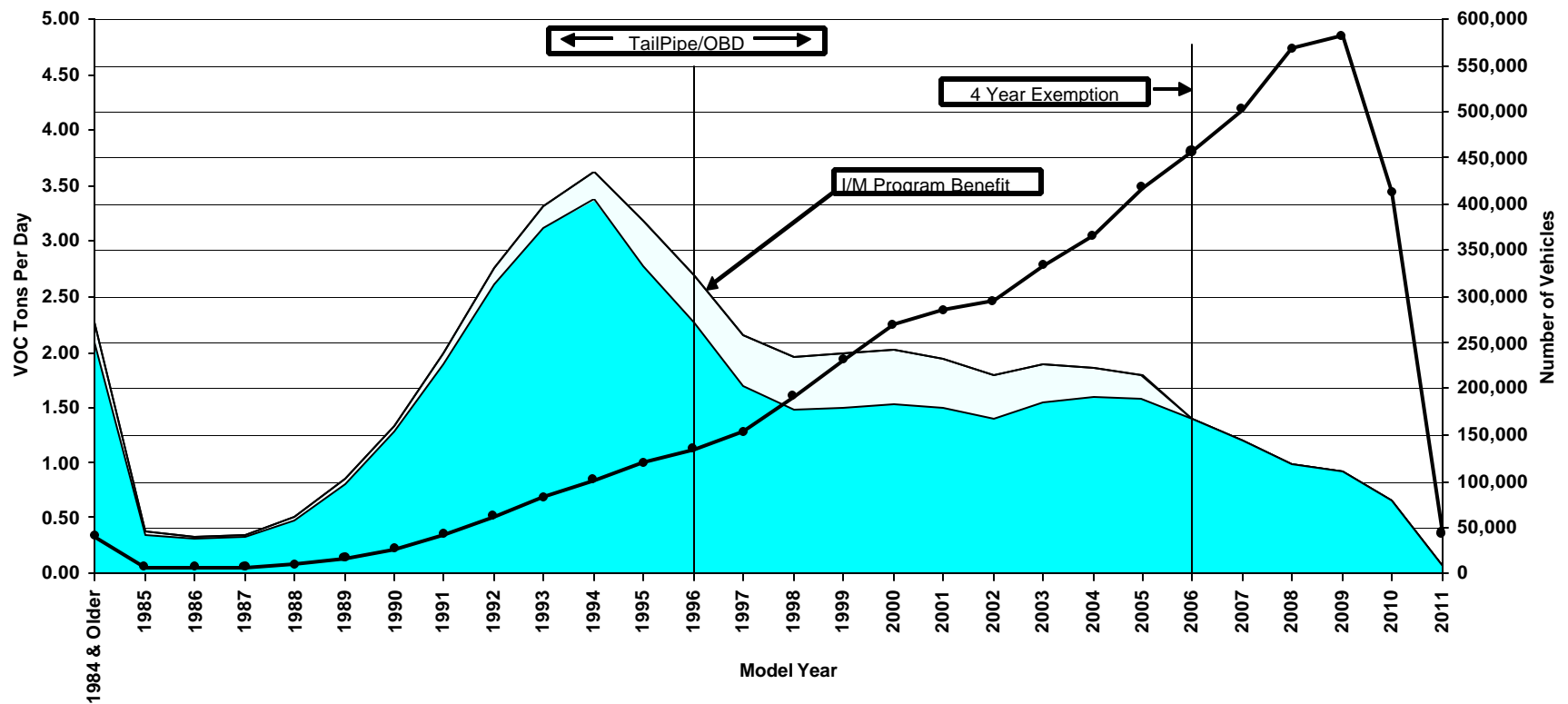


# Projected Statewide Vehicle Daily Miles of Travel (VMT)





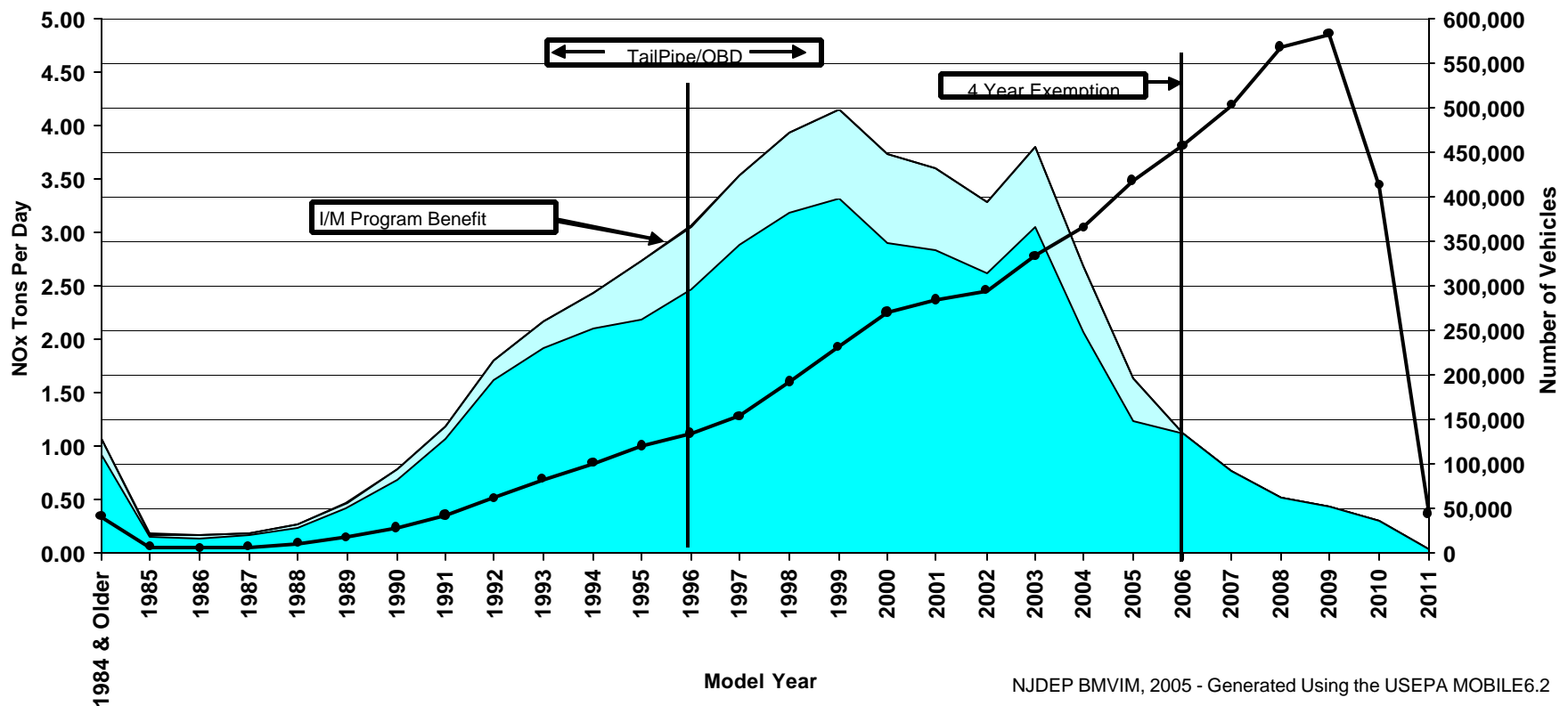
# Estimated Projected 2010 VOC Emissions



NJDEP BMVIM, 2005 - Generated Using the USEPA MOBILE6.2



# Estimated Projected 2010 NOx Emissions





# Future Program Design Dilemma

		VOC		NOx	
Vehicle Age	Fraction of Vehicles	Fraction of Emissions	Fraction of I/M Benefits	Fraction of Emissions	Fraction of I/M Benefits
Pre-OBD	9.1%	47.7%	26.2%	28.0%	21.0%
OBD	90.9%	52.3%	73.8%	72.0%	79.0%

A small fraction of vehicles (pre-OBD) contribute more than their share of the pollution and I/M Program Benefit.



# Technologies for Vehicle Testing - Emissions -

- Tailpipe Testing
  - Idle Test
  - 2500 RPM Test
  - ASM5015
- Gas Cap Test
- Remote Sensing
- On-Board Diagnostics (OBD)
  - Lane/Garage
  - Wireless
    - Transponder
    - Cell phone
  - Kiosk
  - Internet or mail in



# Conclusion

- Health Impacts of Air Pollution
- On-Road Vehicles are a Significant Source of Air Pollution in New Jersey
- Emission Reduction Benefits Occur when the Vehicle is Maintained and / or Repaired
- Existing Technologies will Enable a Change in the Inspection Paradigm
  - How
  - When
  - How do we get ready





# Contact Information

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